Service Manual

Sharp

MODEL

BP-102C

SPECIFICATIONS

Tuning Range ..... AM 530~1650 kHz
Intermediate Frequency ... 455 kHz
Power Supply ..... DC 3V (2 UM-3 batteries)
Audio Output ..... 150 mW maximum
Speaker ..... 2-3/8″ (6cm), P.D.S. 10 ohm

Transistor Complement

Q1	2SA354B	Converter
Q2	2SA353C	1st IF Amplifier
Q3	2SA12C	2nd IF Amplifier
Q4	2SB77D	Audio Amplifier
Q5, 6	2SB77C	Output (Matched Pair)

GENERAL DESCRIPTION

The circuit used in this pocket-portable radio incorporates 6 transistors, 1 diode and 1 thermistor. Located on a printed circuit board with newly developed printed resistors.

Signal picked up by a ferrite bar antenna is fed back to converter and then is amplified through 2 IF stages and is detected.

The signal then passes through the 3 transistors audio amplifier circuit.

An AVC voltage is fed back to 1st IF amplifier.

CHASSIS REMOVAL

1. Remove the battery cover and batteries.
2. Push up the bottom of the back cover and separate it from the cabinet.
3. Remove the 3 screws located on the printed circuit board.
4. Carefully pull the chassis out of the cabinet.

HAYAKAWA ELECTRIC CO., LTD.
OSAKA, JAPAN

ALIGNMENT INSTRUCTIONS

Should it become necessary at any time to check the alignment of this receiver, proceed as follows;

1) Connect an output meter across the speaker voice coil lugs.
2) Set volume control for maximum.
3) Attenuate the signals from generator enough to swing the most sensitive range of output meter.
4) Use a non-metallic alignment tool.
5) Repeat adjustment to insure good results.

AM ALIGNMENT CHART

Signal generator			Receiver		Adjust
Step	Connection to receiver	Input signal frequency	Dial setting	Remarks	
1	Connect signal generator through a 10K ohm resistor to the antenna tuning condenser. Ground lead to the receiver chassis.	Exactly 455kHz (400Hz, 30%, AM modulated.)	Tuning gang fully open. (minimum capacity)	Adjust for maximum output on speaker voice coil lugs.	T3 T2 T1
2	Use radiating loop, loop of several turns of wire, or place generator lead close to receiver for adequate signal pickup. Connect generator output to one end of this wire.	Exactly 600kHz. (400Hz, 30%, AM modulated.)	600kHz	Same as step 1.	L2 L1
3	Same as step 2.	Exactly 1200kHz. (400Hz, 30%, AM modulated.)	1200kHz	Same as step 1.	C4 C3
4	Repeat steps 2 and 3 until no further improvement is obtained.				

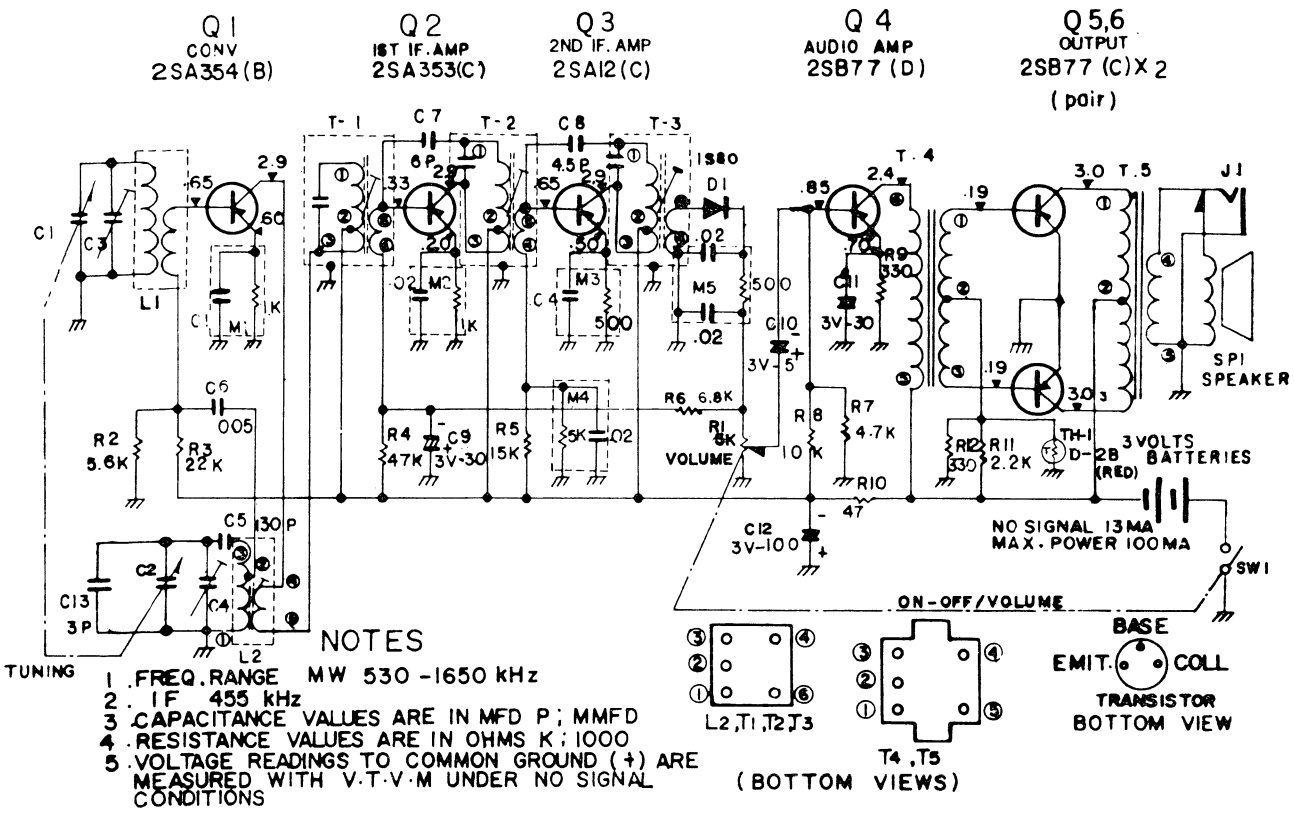
NOTE: Check alignment of receiver antenna coil by bringing a piece of ferrite (such as a coil slug) near the antenna loop stick, then a piece of brass. If ferrite increases output, loop requires more inductance. If brass increases output, loop requires less inductance. Change loop inductance by sliding the bobbin toward the center of ferrite core to increase inductance, or away to decrease inductance. This adjustment will not be required unless L1 has been replaced.

PRINTED RESISTOR REPLACEMENT

Unlike conventional carbon film or solid resistors the printed resistors adopted in this radio consist of plastic resin and carbon powder printed directly on the printed circuit board. Silver powder is also printed on the circuit at connecting points (both ends) to facilitate wiring. Advantages of printed resistor are: 1) easy wiring, 2) increased durability against shock, 3) less space required and 4) more uniform characteristics, truly ideal for solid state pocket radio circuits.

When repairing or replacing the printed resistor circuit, be sure to observe the following:

1. When replacing parts be careful not to crack or scratch the surface of the printed resistors.
2. When a printed resistor is defective, scratch the carbon in front of printed circuit board and scratch solder resist paint in back of printed circuit board with a knife and install an ordinary resistor of equivalent value. (Replacement of entire printed circuit board is not necessary.)
3. When soldering a new resistor or other parts, use a small soldering iron (20~30 watts). Soldering should be done rapidly.



LAST PARTS NO. R12, C13

Figure 1 Schematic Diagram

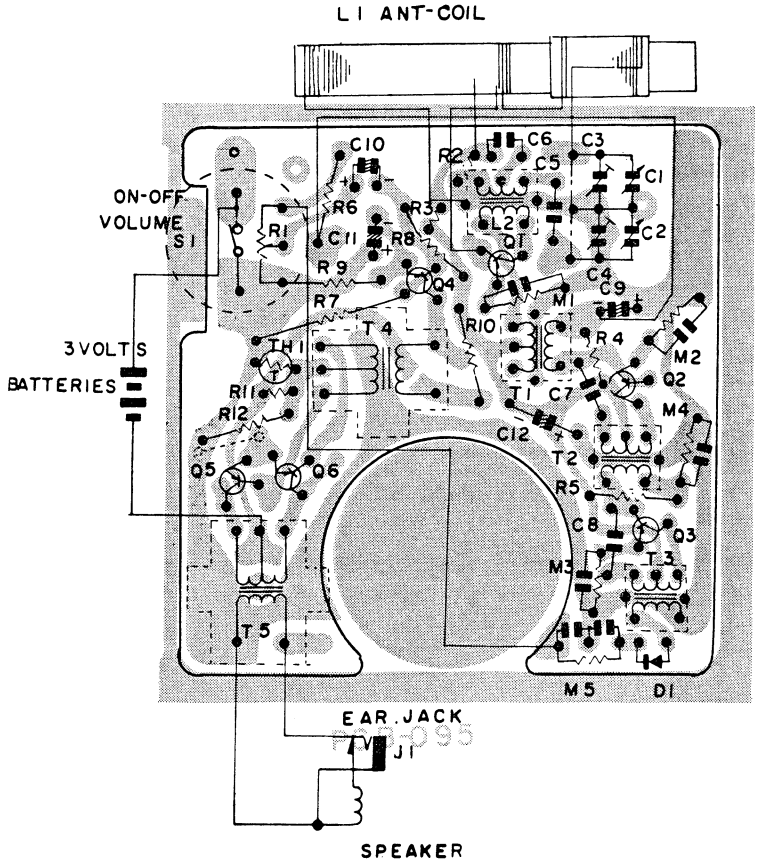


Figure 2 Wiring Side of Printed Circuit Board

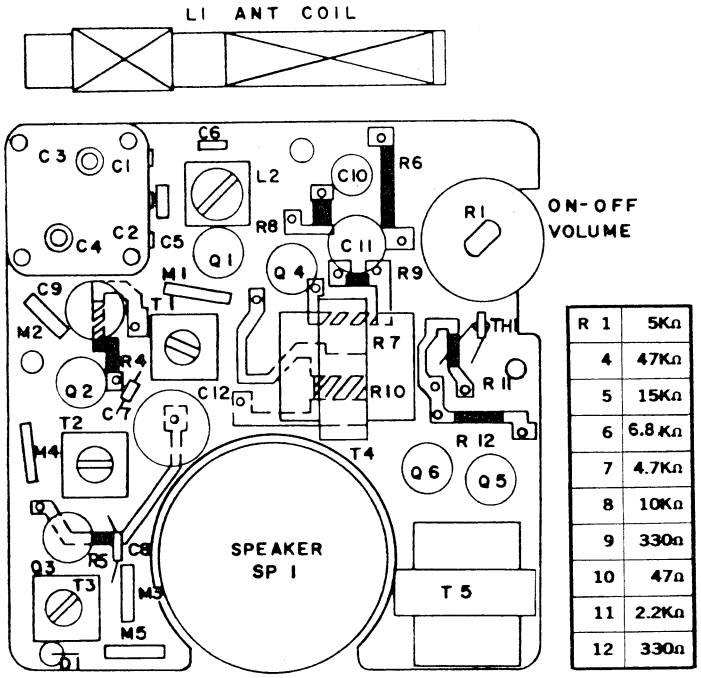


Figure 3 Component Side of Printed Circuit Board

PARTS LIST

CAPACITORS

REF. NO.	PART NO.	DESCRIPTION	PART NAME
C1, C2, C3, C4	1560231600	Variable Tuning Gang with Trimmers	VC-316
C5	1554213717	130PF, 50V, 5%, Discap	T-5-137J
C6	1556250637	.005MFD, 50V, 20%, Mylar	ML-5-506M
C7	1552260927	6PF, 50V, .5PF, Discap	D-5-609D
C8	1552245927	4.5PF, 50V, .5PF, Discap	D-5-459D
C9, C11	1561230210	30MFD, 3V, Electrolytic	CU-03-302X
C10	1561250310	5MFD, 3V, Electrolytic	CU-03-503X
C12	1561210110	100MFD, 3V, Electrolytic	CU-03-101X
C13	1552230917	3PF, 50V, .25PF, Discap	D-5-309C

RESISTORS

R1/SW1	1548282100	5K ohm, Pot., Volume Control with Switch	8V-821
R2	1543256221	5.6K ohm, 1/8W, 10%, Carbon	1/8SU-5.6KK
R3	1543222321	22K ohm, 1/8W, 10%, Carbon	1/8SU-22KK
R4, R5, R6, R7, R8, R9, R10, R11, R12	1546270200	Printed Resistor	PRCB-4055

PACKAGED CIRCUITS

M1	1656631900	Capristor	PRC-319
M2	1656633200	Capristor	PRC-332
M3	1656630700	Capristor	PRC-307
M4	1656631500	Capristor	PRC-315
M5	1656630300	Capristor	PRC-303

REF. NO.	PART NO.	DESCRIPTION	PART NAME

COILS AND TRANSFORMERS

L1	1508215120	Coil, Antenna	8L-151A
L2	1507203000	Coil, Oscillation	7L-030B
T1	1507274700	Transformer, 1st IF	7IF-747
T2	1507274600	Transformer, 2nd IF	7IF-746
T3	1507271800	Transformer, 3rd IF	7IF-718
T4	1516280300	Transformer, Audio Drive	6T-803
T5	1517282200	Transformer, Audio Output	7T-822

SEMICONDUCTORS

Q1	1527213721	Transistor, Converter	2SA354
Q2	1527213831	Transistor, 1st IF Amplifier	2SA353
Q3	1522210131	Transistor, 2nd IF Amplifier	2SA12
Q4	1522211341	Transistor, Audio Driver	2SB77
Q5, Q6	1522211338	Transistor, Output (Matched pair)	2SB77
D1	1527271601	Diode, Detector	1S80
TH1	1522280202	Thermistor	D-2B

MISCELLANEOUS

	11032321	Cabinet, Front	3CAB-4150A
	11034321	Cabinet, Back	3CAB-4150B
	11062821	Panel, Dial	PANEL-4150
	11092328	Knob, Tuning	9K-328
	11092380	Knob, Volume Control	9K-380
	11242831	Emblem "Sharp"	IND-P4055B
	11302895	Punching Metal	PUNCH-4150
	11512723	Case, Leather	LEATH-4219
	11932091	Strap	BELT
	11932471	Holder, Strap	BELT HOLDER
	11932474	Cover, Batteries	B-BUTA4055
	1393250956	Spring, Battery Terminal	B-SPRING
	1393279600	Holder, Batteries	B-HOLD4219
	1393292456	Terminal, Battery	B-TANSI
J1	1530211800	Jack, Earphone	J-118
SP1	1570218900	Speaker	6P-81H

Printed in Japan